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Tatsuo Nakajima

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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/058,064  
Filing Date: January 29, 2002  
Appellant(s): NAKAJIMA ET AL.

MAILED  
MAR 22 2007  
Group 3700

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Tarik M. Nabi  
For Appellant

**SUPPLEMENTAL  
EXAMINER'S ANSWER**

This is in response to the appeal brief filed October 18, 2006 appealing from the Office action mailed August 11, 2004.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

4,171,626	YATES et al	10-1979
6,409,606	NAKAJIMA et al	06-2002

3,954,950	RAM et al	05-1976
3,775,520	RAM et al	11-1973
3,900,556	CLARKE	08-1975

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 3, and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Yates (626). The patent to Yates discloses the recited plastic pipe comprising a fibrous layer which can be formed in various angles including an angle of 0 degrees with the longitudinal axis where the reinforcement is made of a plurality of bundles of one of many different fibers or mixtures thereof where the fibers can be glass or carbon fibers having various modulus of elasticity which fall within the recited range of claim 3, further an reinforced fiber sheet can be provided as set forth in column 5, lines 13-19, and the thickness of these layers can be seen to be within the claimed range of claim 6 as set forth in examples I and II, where the pipe can be formed by a pultrusion method, and the outer layer 4 can be seen to have fibers running circumferentially around the shaft. With respect to Yates reinforcement bundles the references incorporated by reference to Ram (950 and 520) and Clarke set forth how the fibers and bundles thereof are formed for the invention of Yates, where for example Ram 950 clearly sets forth in column 3, lines 37-50 that the fibers forming the bundles are formed using wet or dry

spun methods, in column 3, line 66 to column 4, line 5 that the filaments making up the multifilament yarn are imparted with a twist to improve handling characteristics.

Therefore, as incorporated by reference the fiber bundles of Yates are formed of fibers created by spun techniques and are further twisted into bundles forming yarns, and therefore such are considered to be spun fibers when it is not clear from appellant's specification as to whether spun is referring to how the fibers were formed or that the yarn formed by the fibers is twisted.

Claims 1-21 are rejected under 35 U.S.C. 103(a) as being obvious over Nakajima in view of Yates (626).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the

reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2). The patent to Nakajima discloses the recited fiber reinforced plastic pipe formed of a longitudinally slit sleeve which can be placed within a drive shaft, where the sleeve is made by pultrusion, the fibers are parallel and can run longitudinally, a plurality of layers can be provided, the sleeve can be held in by adhesive, various pipe thicknesses are disclosed, and the fibers are known to be as strong as those set forth in Yates and would therefore inherently have the same elasticity. The patent to Nakajima discloses all of the recited structure with the exception of forming the reinforcing fibers into bundles, forming the extra layers as sheets, and some of the specific properties of the extra layers, however it is considered an obvious choice of mechanical expedients to form the extra layers of any specific elasticity and basis weight using routine experimentation to arrive at optimum values as such only requires routine skill in the art. It would have been obvious to one skilled in the art to modify the fibers in Nakajima to be formed of bundles and to form the extra layers as sheets circumferentially disposed as suggested by Yates as such would provide for a stronger sleeve that would be more resistant to shock and provided with greater reinforcement.

#### **(10) Response to Argument**

With respect to arguments set in section "a" of page 8 of the appeal brief, predominantly the arguments are directed to the reference to Yates allegedly not setting forth fiber bundles that are not only pultruded but are also "spun". Appellant's

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specification does not clearly set forth what is meant by the term "spun" and as per Merriam Webster's Collegiate Dictionary, Tenth Edition, spun is the past tense of spin, and when referring such to fibers defines this term as meaning "to draw out and twist fiber into a yarn or thread" or "to form a thread by extruding viscous rapidly hardening fluid", therefore it is believed that inherently the yarn set forth in Yates can be considered to be spun as set forth by the dictionary definition. However, it is also noted that Yates sets forth three references relating to the threads and yarn structures of the invention in the '626 patent, and specifically how the fibers were formed. The three references are recited above, and are merely being used to provide further subject matter that was incorporated by reference in the Yates reference, therefore this material was always part of Yates, and is being supplied to address the new argument that the term spun was allegedly not provided in Yates. The examiner addressed this argument in the Advisory Action of January 4, 2005 where the examiner stated this was inherent to the fibers, and the incorporated references set forth further structure of the fibers in Yates that was not supplied in the specification of Yates directly. As set forth above the Ram '950 reference sets forth both that the fibers forming the bundles are formed from a spun process, but also that the bundles are provided with a twist. Since it is not clear to what the term spun is being applied by appellant without a clear description of such, the examiner has covered both possible meanings as set forth by the dictionary definition above. Therefore, it is held that Yates in fact teaches pultruding in its specification directly, and further by the incorporated reference to Ram '950 sets forth these fibers are formed by a spun method and further twisted into the fiber bundles that

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make up the reinforcing yarn of Yates. Therefore, it is held that Yates sets forth in column 3, lines 23-39 that the fibers are formed having an elasticity of 172-448 Gpa when such is converted to Gpa, that the fibers and bundles are formed from "known techniques" where such techniques are set forth in three references incorporated by reference which include spun and twisting techniques, and Yates covers the claim language set forth in the claims under rejection as anticipated by Yates above.

With respect to arguments in section "a" on page 9 referring to Yates not disclosing insertion into a metal pipe, such is not persuasive in that claims 1, 3, and 6 only are set forth as anticipated by Yates, and these claims only recite a fiber reinforced plastic pipe, not insertion of such into a metal pipe. Such subject matter is in claim 2, which is not rejected under anticipation by the Yates reference, therefore this argument is not persuasive in that it is more detailed than the claimed subject matter.

With respect to the argument that Yates filament winding method cannot result in the reinforced fiber sheet, such is not persuasive where the appellant's claims are directed to a fiber bundle aligned in a longitudinal direction and a circumferential reinforced fiber sheet. Yates clearly sets forth in column 5, lines 4-19 that additional layers can be added that have carbon fibers or glass fibers disposed an angle of 0 degrees to a line parallel to the longitudinal axis of the shaft, and the further plies can also be provided, and as set forth in column 6, lines 26-33 that the reinforced layers are provided by methods including pultrusion, filament winding, and tube rolling it is clear that Yates sets forth methods of providing the reinforcement layers at 0 degrees to the longitudinal axis and the methods used include methods such as tube rolling or



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pultruding that would be capable of providing the reinforced layer made of fibers provided as bundles that extend in the longitudinal direction (0 degrees to the longitudinal axis) contrary to what appellant is arguing. Methods are set forth for forming the reinforced layers which would result in a fiber sheet, for example the tube rolling which is known to be a roll of a layer to form a longitudinal seam type article. Therefore appellant's argument is not persuasive that Yates is not teaching a sheet, Yates sets forth a plurality of reinforced layers, where one layer can be formed of the fiber bundle extending in a longitudinal direction as set forth in claim 1, and further reinforcing layers are provided which can be disposed in wrapped form, where the prepreg layers that are tape wound are considered circumferential reinforced fiber sheets as set forth in claim 1. Therefore, Yates disclosing tape wrapping or tube rolling both are setting forth reinforced structures which are inherently sheets. One would not define a tape as single fibers or unwoven fibers. Without any specific section of Yates being set forth appellants argument, and the fact the examiner is having trouble finding where in Yates it discloses "unwoven cloth" as argued, it is not clear that such would preclude any of the structure set forth in Yates and described above to meet the claim limitations.

With respect to arguments on page 10 of the appeal brief, section "b", the initial argument is directed toward both the pultrusion and spun fibers not being taught by the prior art, however, it is clear this argument is directed toward the modifying reference of Yates which is discussed above with regards to these same arguments. The base reference to Nakajima sets forth in column 3, lines 44-58 that the fiber reinforcements

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can be provided by a sheet wrapping method, which would equate to the modifying reference to Yates teaching such methods as well as known methods of providing the layers of the tube structure, and therefore merely appears to lack teaching of spun, but Yates provides this teaching, therefore the argument is not persuasive when such is taught by the modifying reference to Yates. Further Nakajima is teaching that pultrusion methods can be used to form the same types of sheets of reinforcement embedded in plastic, and therefore teaches that the combination of these methods and interchangeable nature of these methods are known in the art. Yates is in fact being used to teach only that fibers for reinforced layers of reinforced plastic pipe structures for use in driveshaft applications can be formed of either fibers or bundles of fibers where such fibers are formed by spun methods and can be twisted into bundles as well. Therefore the argument that Yates does not teach the longitudinally slit structure is not persuasive when such is being used only to modify the fibers being provided in bundles. Nakajima teaches multiple reinforced layers which are set forth as teaching circumferential reinforced fiber sheet, where such is further supported by the teachings of Yates as well.

With respect to the argument that Yates does not teach a "high flexural rigidity" such is immaterial when such is not a claim limitations, however, such is also not clear when the same high strength fibers of appellants claims are set forth in Yates, and any structure used as a drive shaft made of such materials would inherently have high flexural rigidity such an argument is not persuasive. Further it is believed that Yates does not set forth a flexible shaft therefore it would inherently have to be provided with

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high rigidity to function properly. With respect to the argument that bridges pages 12 and 13 of the appeal brief, it should be noted as set forth above, Yates is being provided to teach using bundles of fibers to form the reinforcements, and not complete replacement of the entire shaft of Yates into Nakajima, therefor the argument that one would not be motivated to replace a two piece shaft of Nakajima with a single piece shaft of Yates is immaterial when the examiner is using the teachings to form reinforcements for shaft elements formed of reinforced plastics can use reinforcements formed of bundles. Any suggestion that one skilled in the art would require utilizing the entire shaft replacement from one reference to the other is not persuasive when the examiner is using the teachings of Yates to show merely that reinforcements can be bundled, and such an argument is unfounded when this is not the manner in which Yates is being used to modify the base reference to Nakajima.

With respect to the arguments directed at claims 3 and 4, such is not persuasive when the claim language recites, the 196 GPa "or more" and 58.8 GPa "or more", and Yates discloses that the fibers of the bundles exceed these limits and therefore meet the claim language including the phrase "or more" which allows for elasticity levels above those recited as well, which is taught by Yates. Therefore, these limitations are taught by the reference to Yates, and the fibers are equivalent to those used in Nakajima and therefore are inherently as strong as the fibers in Yates, especially when both references deal with high strength elements used to form drive shafts. With respect to the argument that Nakajima fails to disclose the elasticity of the fibers and therefore cannot be optimized by one of routine skill in the art is not setting forth in any

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way that such is a critical feature incapable of one skilled in the art of arriving at these values, however, such would not be persuasive when the same type of fibers are being set forth in Yates in the same type of application and are set forth as being at least of the elasticity set forth in claims 3 and 4 in that they are greater in value and therefore would be considered to meet the "or more" language of these claims.

With regards to claims 5 and 6, the same argument is set forth that Nakajima is silent on the fiber sizes used, and one skilled in the art would not be motivated to optimize the fibers. Such is not setting forth a proper discussion of why such is a critical feature, and further based upon the rather large ranges set forth in these claims, there appears to be no criticality to these limitations. Further, such are also taught by Yates as known sizes utilized for reinforcements in equivalent structures of drive shafts, that being reinforcement layers embedded in plastic to form structural elements of a drive shaft.

With regards to claims 7-21, it was discussed above the examiner's position on the combination of Yates with Nakajima, that being that Yates is used to teach equivalent types of reinforcements used, not an attempt to substitute or use in some way, the shaft of Yates in or in replacement of Nakajima, rather the substitution is at the level of the reinforcement utilized in the structural elements of Nakajima as set forth by the same type of structural elements used in Yates, that being the types of reinforcements. Therefore, appellants argument is misconstruing the examiners rejection, where the examiners modification of Nakajima is not consistent with appellants arguments.

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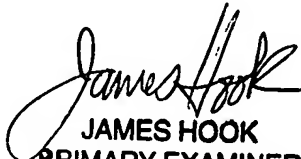
**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

James F. Hook

  
JAMES HOOK  
PRIMARY EXAMINER

Conferees:

K. Shaver



E. Keasel

